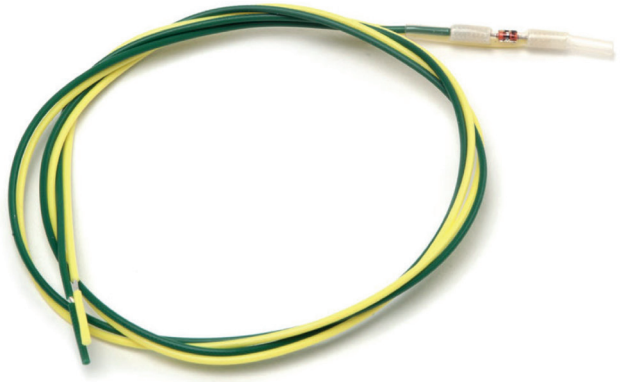
KTY 84 semi-conductor

KTY 84 is a temperature-dependent semi-conductor with a positive temperature coefficient. Typical for these sensors is the monitoring of temperatures and limit values in the field of industrial metrology. The sensor's small dimensions render it ideal for installation in windings as a thermal overload protection.



KTY 84 semi-conductor

Typical applications

The sensor's very high precision and reliability make it suitable for a variety of applications within industry and vehicles.

Industrial applications

- Overheating protection in electric motors, generators, transformers, power supply units, motor bearings, etc
- Temperature monitoring in process flows.
- Temperature compensation for microprocessors

Vehicle applications

- Oil temperature, oil level
- Water temperature
- Diesel injection
- Transmission
- Coolants for engines
- Air conditioning

Properties

- Temperature monitoring at a low cost within a wide temperature spectrum -40° - +300°C (temperature resistance for wiring, insulation, etc. selected according to the specific application)
- Very long life
- High long-term stability
- Low weight
- Short thermal time constant
- Greater output

Description/Function

The KTY 84-1 series of temperature sensors is a semi-conductor (with anode/cathode connection) that has a resistance temperature characteristic curve that is nearly linear over the entire temperature range. The temperature coefficient is positive.

KTY 84 is available in three versions:

- KTY 84-130 (our standard sensor)
- KTY 84-150
- KTY 84-151.

The differences between the variants can be found in the technical data.

NOTE ! It is very important that the polarity is checked when connecting the sensor. If the sensor is incorrectly connected the resistance curve will not match with the data sheet or connected electronic apparatus

Colour/Connection

KTY-84 is a semi-conductor where one end is an anode (plus) and the other a cathode (minus). A wide range of colour combinations is available on the market. The sensor's ring marking can be checked to ensure the wirring is correct. Ther ring is the cathode side.

It is therefore of the utmost importance to know what the wire colour codes are for the anode and cathode in those cases where the sensor is embedded.

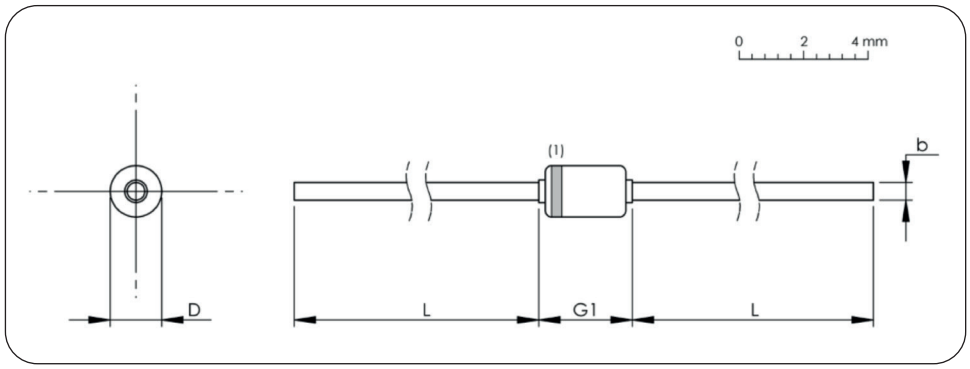
To verify the polarity by way of measurement requires heating of the sensor to see when the resistance follows the temperature curve as shown in the data sheet

Packaging

Standard item sold individually (see item list).

For other versions request MOQ.

Dimensions KTY84-1 sensor



b max.	D max.	G1 max.	L min.	Unit
0,55	1,6	3,04	25,4	mm

Note (1): The marking band indicates the cathode.

Alternative versions

The KTY 84 sensor can be purchased solely as a sensor component without wiring or for mounting in motor windings or motor bearing installations, etc. Examples of alternative versions follow hereafter.

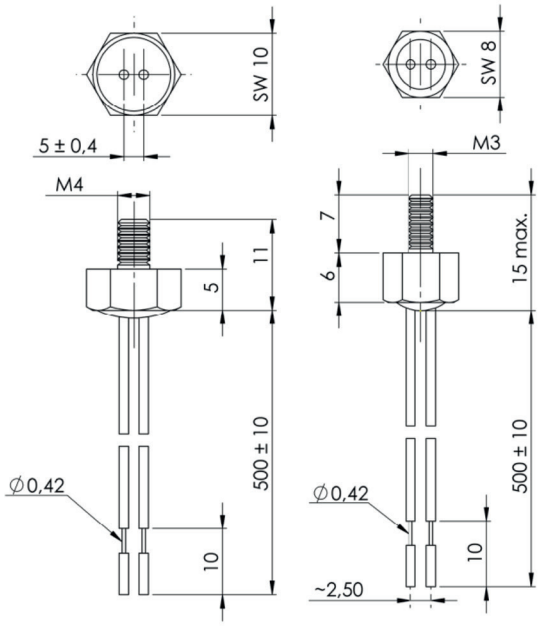
KTY - sensor in windings

Color coding of leads, according to the SIEMENS standards:

- AWG24, white = minus
- AWG24, brown = plus

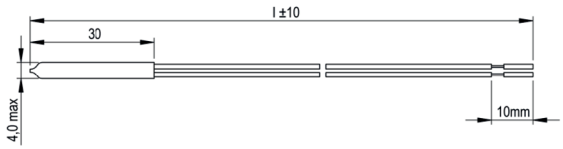
or:

- AWG24, yellow = minus
- AWG24, green = plus

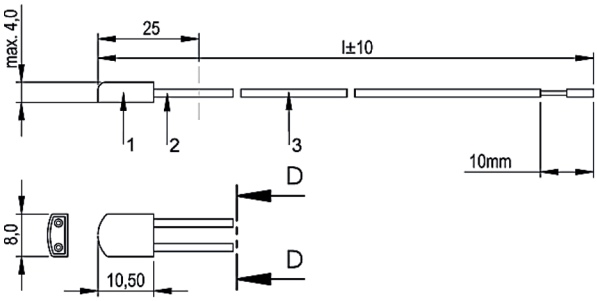


Examples of KTY-thermistor-housings

Shrink tube housing for monitoring windings



Shrink tube housing for monitoring windings

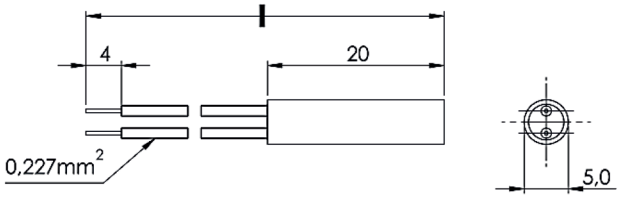


1 = KTY-sensor, insulated twice, in stainless steel or PPH-housing

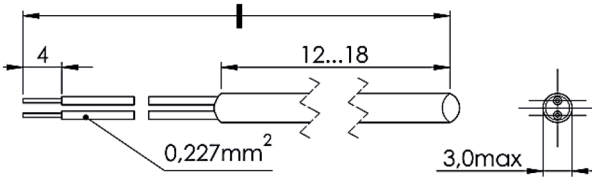
2 = Terminal: stranded silver copper wire insulated with Teflon (PTFE), AWG 24 or AWG 26 according to the manufacturers choice; optional: AWG 20

3 = additional shrink tube (optional)

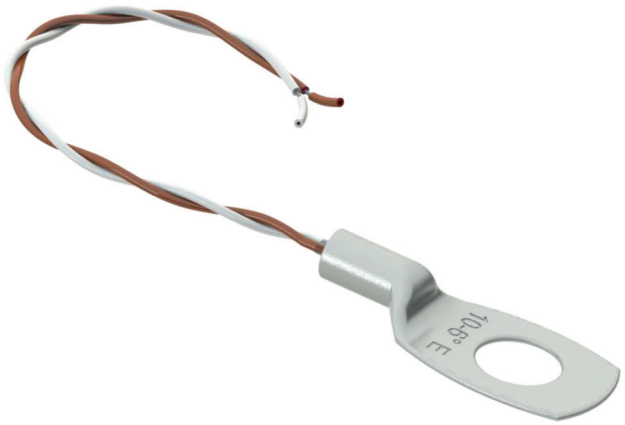
KTY-thermistor in ceramics or stainless steel

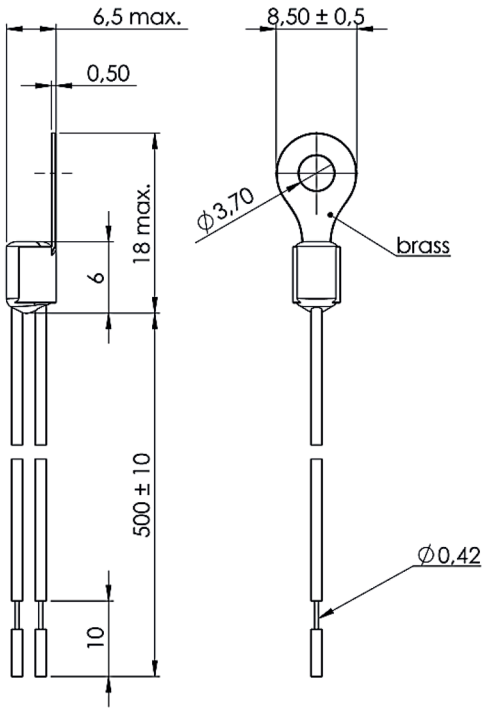


KTY-thermistor in ceramics or brass-housing

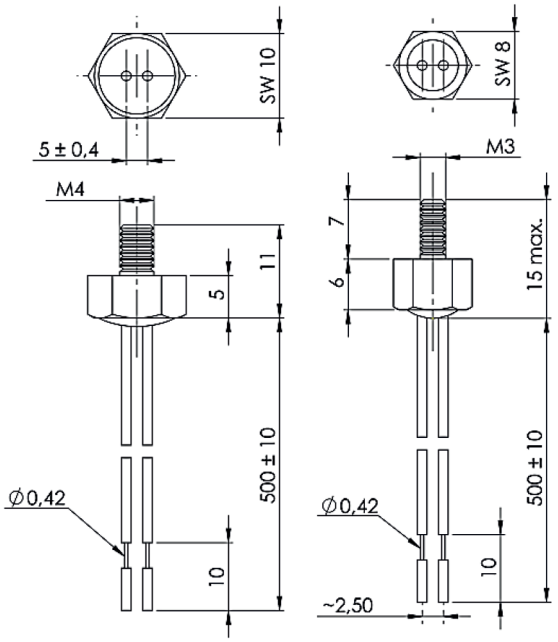


KTY-sensor in cable shoe surface sensor





Screw-in sensors in alu-housing SW10-M4 SM8-M3



Technical data

Quick reference data

Sensor resistance R100, Tamb = + 100°C, Icont = 2 mA

Parameter	Min.	Max.	Unit	Marking-Code
KTY 84-130	970	1030	Ohm	KT84L
KTY 84-150	950	1050	Ohm	KT84M
KTY 84-151	950	1000	Ohm	KT84O

Limiting values

In accordance with the absolute maximum rating system (IEC 60134).

Symbol	Parameter	Conditions	Min.	Max.	Unit
I_{cont}	Continuous sensor current	In free air: T_{amb} = +100°C *	-	10	mA
		In free air: T_{amb} = +300°C	-	2	mA
T_{amb}	Ambient operation temperature		-40	+300	°C
T_{stg}	Storage temperature		-55	+300	°C

* For temperatures greater than +200°C, a sensor current of I_{cont} = 2 mA must be used.

Characteristics

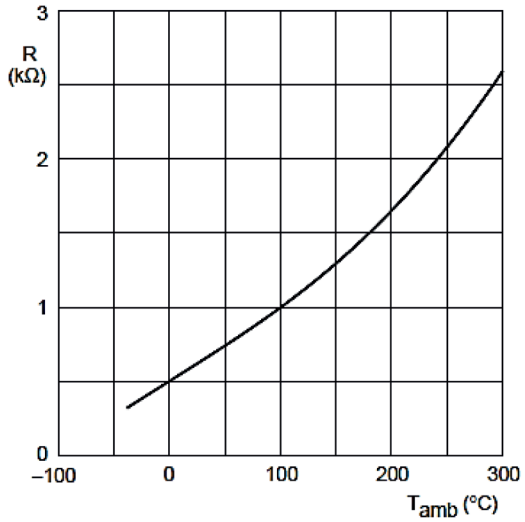
T_{amb} = 100°C, in liquid, unless otherwise specified

Symbol	Parameter	Conditions	Min.	Typ	Max.	Unit
R_{100}	Sensor resistance	I_{cont} = 2mA				
TC	Temperature-coefficient		-	0,62	-	%/K
R_{250}/R_{100}	Resistance ratio	T_{amb} = +250°C and +100°C	2,111	2,166	2,221	
R_{25}/R_{100}	Resistance ratio	T_{amb} = +25°C and +100°C	0,595	0,603	0,611	
T	Thermal time constant **	In still air	-	20	-	S
		I still liquid ***	-	1	-	S
		I flowing liquid ***	-	0,5	-	S

** The thermal time constant is the time taken for the sensor to reach 63,2% of the total temperature difference. For example, if a sensor with a temperature of 25°C is moved to an environment with an ambient temperature of 100°C, the time of the sensor to reach a temperature of 72,4°C is the thermal time constant.
$T_{63,2\%}$ = 25°C + 0,632 * (100°C - 25°C) = 72,4°C

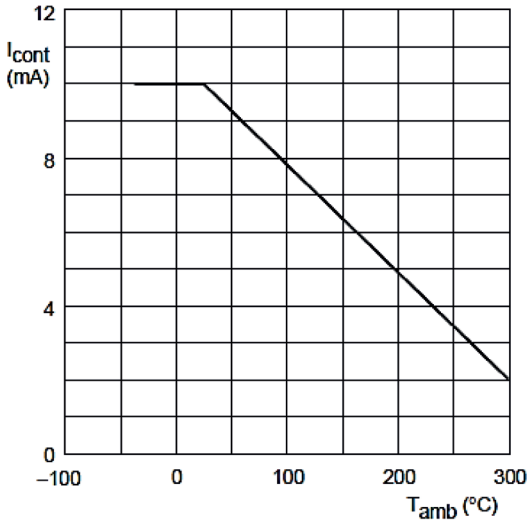
*** Inert liquid, e.g. FC 43 manufactured by the 3M company.

Ambient Temperature [°C]	Temp. Coeff. [%K]	KTY84-130				KTY84-150				KTY84-151			
		Resistance [Ω]			Temp.	Resistance [Ω]			Temp.	Resistance [Ω]			Temp.
		Min.	Typ.	Max.	Error [K]	Min.	Typ.	Max.	Error [K]	Min.	Typ.	Max.	Error [K]
-40	0.84	340	359	379	± 6,48	332	359	386	± 8,85	332	350	368	± 5,79
-30	0.83	370	391	411	± 6,36	362	391	419	± 8,76	362	381	399	± 5,48
-20	0.82	403	424	446	± 6,26	394	424	455	± 8,7	394	414	433	±5,72
-10	0.80	437	460	483	± 6,16	428	460	492	± 8,65	428	449	469	± 5,62
0	0.79	474	498	522	± 6,07	464	498	532	± 8,61	464	486	507	± 5,51
10	0.77	514	538	563	± 5,98	503	538	574	± 8,58	503	525	547	± 5,41
20	0.75	555	581	607	± 5,89	544	581	618	± 8,55	544	566	589	± 5,31
25	0.74	577	603	629	± 5,84	565	603	641	± 8,54	565	588	611	± 5,25
30	0.73	599	626	652	± 5,79	587	626	665	± 8,53	587	610	633	± 5,2
40	0.71	645	672	700	± 5,69	632	672	713	± 8,5	632	656	679	± 5,08
50	0.70	694	722	750	± 5,59	679	722	764	± 8,46	379	704	728	± 4,96
60	0.68	744	773	801	± 5,47	729	773	817	± 8,42	729	754	778	± 4,83
70	0.66	797	826	855	± 5,34	781	826	872	± 8,37	781	806	831	± 4,68
80	0.64	852	882	912	± 5,21	835	882	929	± 8,31	835	860	885	± 4,53
90	0.63	910	940	270	± 5,06	891	940	989	± 8,25	891	916	942	± 4,37
100	0.61	970	1000	1030	± 4,9	950	1000	1050	± 8,17	950	975	1000	± 4,19
110	0.60	1029	1062	1096	± 5,31	1007	1062	1117	± 8,66	1007	1036	1064	± 4,58
120	0.58	1089	1127	1164	± 5,73	1067	1127	1187	± 9,17	1067	1099	1131	± 4,99
130	0.57	1152	1194	1235	± 6,17	1128	1194	1259	± 9,69	1128	1164	1199	± 5,41
140	0.55	1216	1262	1309	± 6,63	1191	1262	1334	± 10,24	1191	1231	1271	± 5,84
150	0.54	1282	1334	1385	± 7,1	1256	1334	1412	± 10,8	1256	1300	1345	± 6,3
160	0.53	1350	147	1463	± 7,59	1322	1407	1492	± 11,37	1322	1372	1421	± 6,77
170	0.52	1420	1482	1544	± 8,1	1391	1482	1574	± 11,96	1391	1445	1500	± 7,25
180	0.51	1492	1560	1628	± 8,62	1461	1560	1659	± 12,58	1461	1521	1581	± 7,25
190	0.49	1566	1640	1714	± 9,15	1533	1640	1747	± 13,2	1533	1599	1664	± 8,27
200	0.48	1641	1722	1803	± 9,71	1607	1722	1837	± 13,85	1607	1679	1751	± 8,81
210	0.47	1719	1807	1894	± 10,28	1683	1807	1931	± 14,51	1683	1761	1839	± 9,36
220	0.46	1798	1893	1988	± 10,87	1760	1893	2026	± 15,19	1760	1846	1931	± 9,93
230	0.45	1879	1982	2085	± 11,47	1839	1982	2125	± 15,88	1839	1932	2024	± 10,51
240	0.44	1962	2073	5184	± 12,09	1920	2073	2226	± 16,59	1920	2021	2121	± 11,11
250	0.43	2046	2166	2286	± 12,73	2003	2166	2329	± 17,32	2003	2112	2220	± 11,73
260	0.42	2132	2261	2390	± 11,44	2087	2261	2436	± 18,15	2087	2205	2321	± 12,42
270	0.41	2219	2357	2496	± 14,44	2172	2357	2543	± 19,36	2172	2298	2424	± 13,37
280	0.38	2304	2452	2600	± 15,94	2255	2452	2650	± 21,21	2257	2391	2525	± 14,79
290	0.34	2384	2542	2700	± 18,26	2333	2542	2751	± 24,14	2335	2479	2622	± 16,98
300	0.29	2456	2624	2790	± 22,12	2404	2624	2844	± 29,05	2406	2558	2710	± 20,61

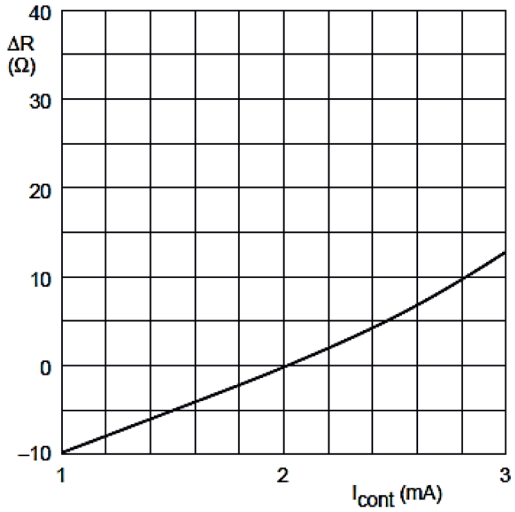


I_{cont} = 2 mA

Sensor resistance as a function of ambient temperature; average values

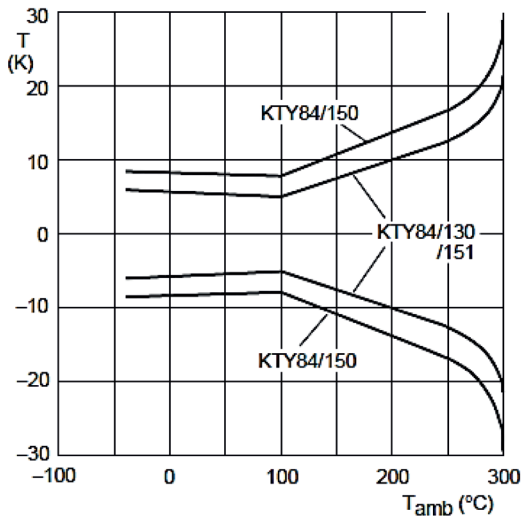


Maximum operating current for safe operation



T_{amb} = 100°C

Deviation of sensor resistance as a function of operating current in still liquid



Maximum expected temperature error (ΔT).

Item list

Item number	Designation	Dimensions/Colour			Insulation (kV)	Measurement area °C
		Sensor (ca mm)	Wire length (ca mm)	Master colour +/-		
126192	Sensor KTY 84-130-500	3,6	500	green/yellow	2,5	-40 ... +190
126094	Sensor KTY 84-130-200	3,6	200	blue/yellow	2,5	-40 ... +190

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How to contact BEVI
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